Archaeological studies of the Hawaiian archipelago have documented that a high level of sociopolitical complexity characterised Hawaiian society at the time of European contact in 1778 (e.g., Earle 1978, 1997, Kirch 1985, 1990, 2000, Kolb 1999, Sahlins 1958, Spriggs 1988). As Kolb (1994a:417) notes, “Hawaiian traditional society, during a period of 1500 years, experienced a dramatic increase in population, the development of a varied and complex subsistence economy, and the rise of a four-tiered chiefly hierarchy.” The most dramatic changes to Hawaiian society occurred during the latter half of the cultural sequence (Hommon 1986, Kirch 1985, 1990, Spriggs 1988). Many archaeological studies that examine this period focus on chiefly institutions such as the building of religious monumental architecture (e.g., Kolb 1991, 1992, 1994a, 1994b, 1997), the expansion and intensification of large agricultural field systems (e.g., Allen 2004, Kirch 1994, Ladefoged and Graves 2000) and the development of social inequality and hierarchical social organisation (e.g., Cordy 2000, Hommon 1986, Kirch 1990). Studies that focus on the social relations between chiefs and commoners at the community level have been somewhat more limited. Recent studies have shown that the community level is significant in examining the nature of social complexity in Hawai‘i (see, for example, Kolb 1997, Kolb and Snead 1997). Social relations between chiefs and commoners were manifest in various ways, including the creation of territorial land units (ahupua‘a) that were occupied by commoners but economically controlled by chiefs. Both the Hawaiian religious system and the chiefly economy served to link the commoners who resided in these territorial land units to each other as well as the ruling elite. Examining the nature and distribution of intermediate-level heiau ‘religious structures’ in relation to changing ahupua‘a boundaries provides insights into sociopolitical relations and how ideology was used to legitimate social and economic divisions.

In the following analysis we examine the functional significance of agricultural heiau distributed throughout the southern portion of the Kohala field system (Figs 1 and 2), an area that was probably developed from ca.
Figure 1: The Kohala peninsula of Hawai‘i Island showing the location of the Kohala dryland field system and *ahupua‘a* boundaries.
A.D. 1550 to A.D. 1800 (Ladefoged and Graves 2004). By considering the spatial configuration of these structures in relation to social, economic and political boundaries and the morphology of architectural design traits that characterise these community-level constructions, a better understanding of their significance is attained. The eight heiau are located in the uplands of five ahupua‘ā in the southern portion of the leeward dryland field system. The structures reflect intermediate level religious activity and we argue that these features represent community-level constructions that were vital in reinforcing the community within the larger chiefly economy.

HAWAIIAN HEIAU AND AGRICULTURAL PRODUCTION

Archaeological research of heiau in the Hawaiian Islands includes broad scale surveys (e.g., James 1995, Kirch 1997, McAllister 1933a, 1933b, Stokes 1991), studies of heiau function (e.g., Graves and Cachola-Abad 1996, Kirch 1990, 2004, Kolb 1991, 1994a, 1997, Ladefoged 1998), dating of heiau (Kirch and Sharp 2004) and analyses of architectural attributes based on archaeological excavation (Kolb 1992). Together these studies have produced a large body of literature describing the form and function of heiau, and are largely augmented by the incorporation of information provided in the form of ethnohistorical accounts (e.g., Cordy 2000). However, many of the studies focus primarily on the larger heiau. Part of this bias is undoubtedly because these are the most archaeologically visible structures and are most likely to have been preserved. Also, theoretical studies on heiau function have largely been concerned with chiefly institutions and power relations in the later portions of the Hawaiian cultural sequence (see, for example, Kolb 1991, 1992, 1994a). They thus emphasise the monumental constructions that were restricted to the ruling elite, such as large luakini heiau ‘sacrificial war temples’. Studies generally ignore the full continuum of the religious system that developed in conjunction with the increasing sociopolitical complexity that characterised Hawaiian society.

The most complete ethnohistorical synthesis of Hawaiian religious practices is the work of Valeri (1985). He notes that Hawaiian religion contained a continuum of deities that were reflected in a continuum of religious practices. Various akua ‘deities’ were related to and controlled different aspects of Hawaiian life and there existed a pantheon of akua that included the four ‘major gods’ (po‘oki‘eki‘e or ke kōko‘oha o ke akua)—Kū, Lono, Kāne and Kanaloa (Valeri 1985:13). Warfare and conquest were in the realm of Kū, the war god, while the system of tribute was bound up in the cults of Kanaloa, the god of male power and irrigated agriculture, and Lono, the god of fertility and dryland agriculture (Kirch 1984, Valeri 1985).
Valeri (1985) identifies two major forms of worship in the Hawaiian religious system. The first was manifest in productivity rituals that were conducted at small local *heiau* by priests, chiefs and commoners. The second system was manifest in sacrificial rituals that were performed at large *heiau* by priests and high chiefs; the largest of these was the *luakini heiau*, which was used exclusively by the *ali‘i nui* (Kamakau 1992, Malo 1951).

In these rituals, *heiau* functioned in various ways and their significance did not necessarily correlate with their material form (see Cachola-Abad 1996). The term “*heiau*” describes any place of worship and can thus refer to a natural or built structure or a location that is considered sacred (Valeri 1985:173). Personal shrines found in residential structures, upright stones and temples built for specific purposes, such as fishing shrines and agricultural temples, are all considered *heiau*. The great diversity of these structures reflects the complex nature of Hawaiian religion and the fact that the domains of the deities to which these structures were dedicated encompassed most aspects of Hawaiian life (Cachola-Abad 2000:110).

The highly varied architectural form of *heiau* has hampered attempts to classify these structures based on morphological attributes (e.g., Stokes 1991, Thrum 1908; see also Cachola-Abad 1996). Kolb, from his extensive work on Maui *heiau*, however, notes a general temporal shift from open courts to elevated platforms and enclosures, based on relative and absolute dating. While it is thought that earlier forms would have been accessible to most members of society, the later forms would have limited public participation in sacred rituals or physically separated elite participants from those viewing the ritual from outside the sacred space (Kolb 1994a:532). Using Kolb’s data from 107 recorded *heiau* on Maui, Graves and Cachola-Abad (1996) performed a stylistic seriation that ordered chronologically the morphological design traits of these *heiau*. They noted both geographic variation, in terms of windward *heiau* versus leeward *heiau*, and temporal variation that was confirmed by radiocarbon determinations.

As recently noted by Kirch and Sharp (2004:102-3), determining the age of *heiau* by the radiocarbon dating of associated charcoal is problematic. In large complex structures such as *heiau* it is often difficult to firmly establish the association of the charcoal with precise building and use episodes. This is sometimes exacerbated by the burning and subsequent dating of old wood that predates temple use. There is also the problem of irregular fluctuations in atmospheric $^{14}$C that can lead to uncertainties of 40 to 250 years (Kirch and Sharp 2004:102). Given the short history of most Hawaiian archaeological sites, the temporal resolution of radiocarbon dating is often inadequate for resolving temporal patterning. Finally, it should be noted that *heiau*
are religious sites that are highly valued by contemporary communities. The excavation and destruction of these sites to obtain datable material is undesirable and problematic. For these reasons researchers in Hawai‘i (Graves and Cachola-Abad 1996, Graves et al. 2002, O’Connor 1998) have developed non-destructive methodologies, such as seriation, for establishing relative chronological ordering of archaeological features.

Studies of heiau on Hawai‘i Island have largely been limited to broad surveys (e.g., James 1995 and Stokes 1991) that do not consider the full range of heiau structures. These studies almost completely ignore heiau located in the context of subsistence production systems. Most research on Hawai‘i Island subsistence production systems has focused on the three most extensive dryland field systems: the Kohala field system, the Waimea-Lālāmilo field system and the Kona field system. These systems were vital sources of surplus economic foodstuffs that supported the chiefly economy. Researchers have hypothesised that the main development of these field systems occurred in the later portion of the Hawaiian cultural sequence, from A.D. 1450-1800 in Kohala (Ladefoged et al. 1996:864, Ladefoged and Graves 2000, Ladefoged et al. 2003) and A.D. 1400-1850 in Kona (Allen 2001:142) and that intensification of the systems occurring relatively late in their development. According to Kirch (1984:189, 1990), the lateral expansion of the Kohala field system had been reached by the 1600s and the system was highly intensified by A.D. 1800. Ladefoged et al. (2003) and Ladefoged and Graves (2000) suggest that the southern portion of the field system was one of the last to be developed; and a suite of 18 recent radiocarbon determinations from this area associated with agricultural walls and trails indicates that development in the south took place from c. A.D. 1550 to A.D. 1800 (Ladefoged and Graves 2004). Given the uncertainties of radiocarbon dating and the limited period of development in the southern portion of the field system (c. 250 years), resolving temporal associations will have to rely primarily on alternative absolute dating methods, such as coral $^{230}$Th dating (see Kirch and Sharp 2004), and on developing relative chronologies.

Scholars working in the Kohala field system have noted the presence of “small agricultural temples” (Tuggle 1979, see also Rosendahl 1972,1994), but until recently (Mulrooney 2004) these structures have not been the focus of research. This lack of attention has been mirrored in regional studies elsewhere in Hawai‘i (e.g., Clark 1986). The goal of our study was to examine the role of religious features (heiau) in the upland portion of the Kohala field system. By examining the spatial distribution of eight heiau in relation to the field system and ahupua’a divisions, we aimed to gain a better understanding of how they functioned within the chiefly economy. The spatial patterning of
archaeological remains and the seriation of morphological traits indicate that *heiau* form and placement on the landscape changed through time. Further, the analysis suggests how the ideological basis of sociopolitical organisation was related to the economic aspects of surplus production.

**ANALYSIS**

Eight *heiau* in the *ahupua‘a* of Kalala, Makiloa, Pāhinahina, Kahua 1 and Kahua 2 were intensively mapped. Table 1 shows the location and morphological attributes of each of the eight *heiau* and Figure 2 depicts their spatial distribution in relation to the southern *ahupua‘a* boundaries.

As Table 1 shows, there is significant variability in the sample of *heiau* in terms of morphology, size (based on surface area) and distribution (among *ahupua‘a*). The *heiau* dataset was analysed in two ways: (i) a seriation of the *heiau* based on morphological design traits was produced, and (ii) the distribution of *heiau* in relation to *ahupua‘a* boundaries was examined. These analyses were carried out to examine variability among the *heiau* in terms of morphological attributes and their temporal and spatial distribution.

**Seriation**

There is substantial variability of *heiau* form in the Kohala sample, which could either represent diachronic design change or functional differences. To investigate this variability, the sample was seriated. Classes of design traits, listed in Table 2, are based on the seriation criteria established by Graves and Cachola-Abad (1996). The diagnostic features used in this seriation are those

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Ahupua‘a</th>
<th>Area (m²)</th>
<th>Morphology</th>
</tr>
</thead>
<tbody>
<tr>
<td>H3</td>
<td>Kalala</td>
<td>550</td>
<td>multi-levelled platform <em>heiau</em></td>
</tr>
<tr>
<td>H8</td>
<td>Makiloa/Pāhinahina</td>
<td>454</td>
<td>walled enclosure with internal terrace</td>
</tr>
<tr>
<td>H2</td>
<td>Kahua 2</td>
<td>1603</td>
<td>multi-levelled walled structure</td>
</tr>
<tr>
<td>H7</td>
<td>Pāhinahina</td>
<td>412</td>
<td>walled enclosure with internal platform</td>
</tr>
<tr>
<td>H1</td>
<td>Kahua 1</td>
<td>910</td>
<td>notched walled enclosure</td>
</tr>
<tr>
<td>H5</td>
<td>Makiloa</td>
<td>329</td>
<td>notched walled enclosure</td>
</tr>
<tr>
<td>H4</td>
<td>Kalala</td>
<td>359</td>
<td>walled enclosure</td>
</tr>
<tr>
<td>H6</td>
<td>Makiloa</td>
<td>190</td>
<td>walled enclosure</td>
</tr>
</tbody>
</table>
established for Graves and Cachola-Abad’s “Zone 4” heiau on Maui (after Kolb 1992). These are located in the arid leeward districts of Honua‘ula, Kahikinui and Kula, which lack perennial streams and exhibited extensive dryland agricultural practices (Kolb 1992:30).

Table 3 illustrates the seriation of the eight heiau mapped in the upland Kohala field system. This seriation uses the traits of multiple levels and of retaining faces, notches and walls as diagnostic features. Other traits, including stacked walls, core-filled walls, lowered surfaces, raised surfaces and internal platforms were not used for the present seriation. All heiau, except H3, had stacked walls and lowered surfaces, so these traits do not show significant variability to aid in seriating the heiau. Core-filled construction was only present in one heiau (H2) and only a single heiau possessed an internal platform (H6). Therefore, these traits were of no use in examining shared design traits. A raised surface was not present in any of the structures and was therefore also omitted as a trait.
In this seriation, seven of eight heiau contain walls, which would indicate that this trait is not as variable as the others. Multiple levels, conversely, are present in four of the eight heiau. Retaining faces are even less common, appearing in three heiau. The notched shape, also known as the “Maui notch style” (Kirch 2004, Kolb 1992, 1994a), is the least common trait, present for two of the eight heiau.

A distinct pattern is visible in the seriation. While most of the heiau share the trait of walls, the other traits show significant variability. Those heiau with multiple levels never have notches, and retaining faces always occur in conjunction with either multiple levels or notches. This overlap may represent a temporal shift in the occurrence of design traits. Based on this seriation, heiau were classified into four groups. Seriation Group 1 includes heiau numbered H3 and H8. Heiau H8 has walls and multiple levels, while H3 has multiple levels only. In seriation Group 2, which includes heiau H2 and H7, the traits of walls, multiple levels and retaining faces are present. Seriation Group 3 includes heiau H1 and H5. These structures have common traits of walls and notches, and H1 also has a retaining face. Seriation Group 4, which includes heiau H6 and H4, is characterised by the presence of walls only. The close fit of this data to the seriation model shows that this classification may represent a historical trend, where Group 1 represents the earliest temporal class followed by Group 2, Group 3 and Group 4.

Table 3: Seriation of heiau based on attributes.

<table>
<thead>
<tr>
<th>Group</th>
<th>Site ID</th>
<th>multi-levels</th>
<th>retaining faces</th>
<th>notches</th>
<th>walls</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>H3</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>H8</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>2</td>
<td>H2</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>2</td>
<td>H7</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>3</td>
<td>H1</td>
<td></td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>3</td>
<td>H5</td>
<td></td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>4</td>
<td>H4</td>
<td></td>
<td></td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>H6</td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
</tbody>
</table>
In their seriation of Maui Island heiau, Graves and Cachola-Abad (1996:26) noted that retaining faces replace walls and multiple levels replace lowered surfaces for Zone 4 heiau. The same trend is not present in the Kohala heiau, where walls and lowered surfaces are common among nearly all of the heiau. The traits that replace walls and lowered surfaces in the Maui sequence (retaining faces and multiple levels) are present in those structures thought to represent the earliest classification (Group 1), which means that an opposite trend may be manifest in the Kohala seriation. The traits of walls and lowered surfaces are present in the later groups of heiau (Group 3 and Group 4). We hypothesise that the heiau in these groups represent the latest portion of the sequence because they contain the “Maui notch style” (Group 3) that would have appeared relatively late in the historical sequence when interactions with Maui districts increased. The latest seriation group (Group 4) contains heiau that have only walls and lack any diagnostic features that distinguish them from heiau in other groups. This Group does not include any other morphological traits that are shared with any other classification. These heiau appear to be a simplified form of previous more complex morphological classes.

The seriation may not follow the same trend as the Maui sequence for a number of reasons. Firstly, this seriation has analysed structures that have a shorter proposed temporal distribution. While the Maui seriation was based on design traits of heiau that were built between A.D. 1200 and A.D. 1819, the Kohala sample appears to represent a much shorter temporal sequence, because it is located in the southern portion of the field system. According to Ladefoged and Graves (2000, 2004), this area was one of the last areas of expansion within the field system, with significant development occurring probably between A.D. 1550 and A.D. 1800. Because many of the heiau structures are spatially related to the overall spatial configuration of agricultural walls and trails in the area, we can infer that they are associated temporally with this late expansion. The second reason for deviation from the Maui trend may be because this sample of heiau represents a single functional class of heiau (agricultural heiau) rather than a wider range of functional classes. The Maui seriation includes structures that have been assigned functions as war temples, agricultural temples, navigation temples, residences and places of refuge based on ethnohistoric data (Kolb 1994a:524), whereas the Kohala sample represents a single functional group, with variability in design traits that possibly representing different chronological phases within that group. Finally, the discrepancy may also be attributed to the inherent difficulty in comparing structures from different localities. As Graves and Cachola-Abad note (1996:21, also Graves et al. 2002, O’Connor
1998), groups and classes employed in seriations must belong to the same cultural tradition and be located in the same local area. Although heiau from different islands can be assigned to the same cultural tradition because of the distinguishing unifying characteristics of Hawaiian society overall, they are from different local contexts. The Maui seriation is representative of a number of heiau classes over a wide geographic range, while the present seriation has been carried out to examine a small, localised sample. Seriations of these features may not produce similar historical trends because the overall island-wide seriation of Maui included a much wider temporal, spatial and functional range of heiau.

Spatial Distribution

The proposed temporal sequence in the Kohala seriation is also manifest in the spatial distribution of the heiau in terms of changing community-level boundaries. No significant spatial clustering of heiau is found in any of the five ahupua‘a, and only one of the eight heiau is located on the boundary of two ahupua‘a (see Fig. 2). But, as Ladefoged and Graves (in press) have recently

![Figure 2: The spatial distribution of all seriation Group 1, 2, 3 and 4 heiau, and the historically documented ahupua‘a boundaries of the southern portion of the field system.](image-url)
noted, these *ahupua'a* boundaries changed through time. Hommon (1986) proposed that *ahupua'a* were originally developed as early as the 13th century A.D., and were subsequently divided into smaller and smaller administrative units over time as population increased and “buffer zones” between optimal land units were filled in. This would result in the development of different social and economic units over time.

Ladefoged and Graves (in press) have recently established the historical development of *ahupua'a* boundaries in leeward Kohala by examining the boundaries documented in the mid-19th century, the distribution of the archaeological trails that served as boundaries, and the archaeological agricultural walls that preceded the construction of the boundary trails. By applying a set of explicit criteria (e.g., whether adjacent *ahupua'a* share a common name or whether they have bifurcation points showing that they were subdivisions of larger land units), they identified at least three, and possibly as many as seven, levels of territorial divisions that occurred through time. In the five southern *ahupua'a*, where the eight *heiau* studied are located, the historical and archaeological evidence is clear that at some

![Figure 3: The spatial distribution of three of the four seriation Group 1 and 2 *heiau* and the boundaries of early territorial units.](image-url)
point in time there were only two territorial units. Through time these units were subdivided to form four territorial units, and these in turn were further subdivided by the mid-19th century into the five *ahupua'a* that were historically documented.

These groupings by Ladefoged and Graves (in press) are relevant for examining the spatial distribution of *heiau*, in conjunction with the proposed temporal sequence based on the seriation presented above. There is a distinctive spatial pattern in relation to the changing *ahupua'a* boundaries over time that correlates well with the proposed temporal seriation based on design traits. Figure 3 shows the distribution of three out of the four *heiau* from seriation Groups 1 and 2 in relation to the early territorial boundaries that Ladefoged and Graves defined based upon historical and archaeological data. *Heiau* H8 is located on the border of these territories, and *heiau* H3 and H2 are located near the centre of each of the early territorial units. Figure 4 shows the distribution of all seriation Group 1 and 2 *heiau* in relation to later territorial boundaries. At this stage in time a new *ahupua'a* was “cut out” of an existing territorial unit. *Heiau* H7, from seriation Group 2, is located in

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**Figure 4:** The spatial distribution of all seriation Group 1 and 2 *heiau* and the boundaries of mid-period territorial units created through “cut-out” divisions.
the centre of this new territorial unit (the *ahupua‘a* recorded in the mid-19th century as Pāhinahina). This represents a distinct temporal phase when this *ahupua‘a* was separated out from a former territorial unit encompassing Pāhinahina, Kahua 1 and Kahua 2. *Heiau* H5 from seriation Group 3, which has a notched design, correlates well to *ahupua‘a* divisions around this time as well (Fig. 5). This *heiau* is located in Makiloa, which separates out from a former territorial unit that consisted of Kalala and Makiloa. Figure 6 shows the historically documented *ahupua‘a* territories. At this time, H1 (from seriation Group 3) is located in a significant location at the centre of Kahua 1. The seriation suggests that the *ahupua‘a* of Pāhinahina was defined first (based on the location of *heiau* H7 from seriation Group 2), followed by Makiloa and Kahua 2 (based on the location of seriation Group 3 *heiau*). Those *heiau* that fall into seriation Group 4 (H6 and H4) do not appear to be related to changes in *ahupua‘a* boundaries (see Fig. 2 for their distribution). They are simplified forms located in Makiloa and Kalala, and are religious structures that probably represent infilling of the *ahupua‘a* after the boundaries had been established.

![Figure 5: The spatial distribution of all seriation Group 1 and 2 *heiau*, one seriation group 3 *heiau* (H5), and the boundaries of mid-period territorial units created through two “cut-out” divisions.](image)
In short, the patterning in the spatial distribution of different groups of heiau among changing ahupua‘a land divisions suggest at least five distinct temporal phases. The first temporal phase includes three out of the four heiau from seriation Groups 1 and 2 (H2, H3 and H8). These heiau correspond to the early territorial definitions (see Fig. 3). The second temporal phase includes the fourth heiau from seriation Groups 1 and 2, i.e., heiau H7. It is located in the ahupua‘a of Påhinahina and corresponds to the time when Påhinahina had been separated off from Kahua 1 (see Fig. 4). The third temporal phase includes H5, a heiau of seriation Group 3. It is associated with the separation of Makiloa ahupua‘a from Kalala (see Fig. 5). The fourth temporal phase includes H1, a heiau from seriation Group 3, which is associated with the separation of Kahua 1 from Kahua 2 (see Fig. 6). The fifth and final temporal phase includes heiau H4 and H6. These structures represent simplified forms and are associated with infilling of ahupua‘a whose boundaries were already established (see Fig. 2).

Figure 6: The spatial distribution of all seriation Group 1, 2 and 3 heiau, and the historically documented ahupua‘a boundaries.
We propose a temporal sequence for *heiau* construction based on two independent forms of analysis. The seriation analysis of the morphological attributes of eight *heiau* defined four distinct groups. The spatial analysis of the *heiau* in relation to proposed changes in *ahupua‘a* boundaries produced additional patterning. Combining these two data sets leads us to identify five temporal phases of religious activity. The *heiau* that are thought to date to the earliest temporal period according to the seriation are in significant locations in terms of early *ahupua‘a* boundaries; significant correlations continue throughout the subsequent development of new *ahupua‘a* divisions. That the only *heiau* located on an *ahupua‘a* border is placed at the beginning of the seriation and is found on the only border present during the earliest territorial divisions is strong evidence that this pattern represents a real temporal sequence. The association of *heiau* assigned to the middle of the seriation with *ahupua‘a* boundaries that are thought to have occurred subsequently strengthens this conclusion. While absolute dating of these structures would be advantageous, the temporal resolution of radiocarbon dating might not be sufficient to clearly resolve the matter. It would, however, be useful to incorporate both absolute dating and a comparative analysis from *heiau* in other *ahupua‘a* of the field system that follow a similar proposed historical trajectory to this study area.

The spatial distribution of *heiau* is significant in terms of social and economic divisions in the area that are manifest in *ahupua‘a* land divisions. There is no clustering of *heiau* in any of the territorial units. This may indicate that these structures were intentionally distributed evenly across the southern *ahupua‘a* that were part of the 60 km$^2$ Kohala field system. This field system would have supported the chiefly economy that was in place in the latter half of the Hawaiian cultural sequence by providing tribute in the form of foodstuffs. Preliminary analysis of palaeodemographic data from the area suggests that agricultural productivity was higher than was needed by the immediate occupants (Ladefoged and Graves under review), strongly indicating that the area was producing a surplus of agricultural goods. The construction of *heiau* within this field system would have been a central aspect of the social relations between commoners and elite. Although we cannot gain a complete behavioural reconstruction based on this evidence, some findings point to a managerial presence in the field system: *heiau* variation and the even distribution of most seriation Group 1, 2, and 3 *heiau* (which include the six largest *heiau*) among social and economic divisions within a surplus-producing field system. The *heiau* that were examined are monumental in that they are significantly larger than residential features in
the area and have good views of the surrounding landscape and, in many instances, they are architecturally complex.²

The size and distribution of the sampled heiau indicate that these structures were probably constructed by a community. Studies from the agricultural community of Waiohuli on Maui (Kolb 1997, Kolb and Snead 1997) that follow a “microregional analysis” approach (Gaffney and Gaffney 1988, Gaffney and Tingle 1985, 1989, as cited in Kolb 1997) have shown that differential labour investment in the construction of heiau is important for examining community social organisation. In this study, Kolb identifies two levels of human labour expenditure: family projects and suprafamily projects (or custodial projects). Suprafamily projects are further divided into “festive” and “corvée” labour projects. Kolb and Snead (1997:613) explain that the majority of temple architecture in Waiohuli was constructed using corvée labour, which is characterised by centrally organised coordination and enforced participation. These temples are characterised by a surface area that is greater than 500 m². Festive labour projects, conversely, are organised by communities or low-level elites and represent the intermediate level between family labour obligations and those controlled by the chiefly hierarchy. In Kolb’s classification, these structures range from 150 m² to 500 m² in surface area. The construction of these intermediate-level features in the Waiohuli community is not documented until A.D. 1650-1820.

Based on Kolb’s classifications, three of the heiau from Kohala (H1, H2 and H3) would fit into the category of corvée labour projects; the next largest heiau (H8) with a size of 454m² would come close to meeting this size criteria. These four largest heiau, those that could be classified as being built by corvée labour, are associated with seriation Groups 1 through 3 (see Table 1 and Table 3). The remaining four heiau (H4, H5, H6, H7), with sizes of 412m² to 190m², could represent festive labour projects; these are assigned to seriation Groups 2, 3 and 4. This would suggest that there was a decrease in heiau size through time, a notion supported by the statistic that the mean size of heiau assigned to the chronologically earlier seriation Groups 1 and 2 is 755m², whereas the mean size of heiau assigned to the chronologically later seriation Groups 3 and 4 is 448m². Indeed, three of the four largest heiau are assigned to seriation Groups 1 and 2, and three of the four smallest heiau are assigned to the seriation Groups 3 and 4. Interestingly, on Maui Island, Kolb notes that the decrease in the construction of large heiau during the Unification Period, A.D. 1500-1650, was accompanied by an increase in festive projects. Kolb attributes this increase to “the growing importance of petty chiefs [konohiki] as arbitrators of agricultural production” (Kolb 1997:279). In the southern ahupua’a of the Kohala field system it is difficult to assign the heiau to the corvée and festive categories with certainty. However, there does seem to be a general trend that
the larger, more complex (i.e., multi-level) heiau (that is H2, H3, H7 and H8) were constructed earlier in the territories that were also defined during the earlier periods. The exception to this trend is heiau H1, which is large in size but not architecturally very complex. This heiau is assigned to seriation group 3 and was constructed in a territory that was defined relatively late. In contrast to the larger, more complex heiau are the smaller, less complex heiau (i.e., H4, H5, and H6) that in general were constructed later in time in territories that were subsequently defined or in territories that already contained heiau built during the process of religious feature infilling.

The construction of all of these structures would have enabled chiefly intermediaries (low-level managerial chiefs) to maintain power and institutionalise control at the local level. This control would have in turn enabled high chiefs to rule indirectly through these low-level chiefs and would have facilitated the production of an increased quantity of surplus to support the chiefly economy (Kolb 1997:280). In the later portions of Hawaiian prehistory, as agricultural expansion and intensification occurred, boundary maintenance would have been increasingly important. The distribution of heiau across ahupua‘a social divisions is indicative of one aspect of this boundary maintenance. By conspicuously placing large agricultural heiau fairly evenly across ahupua‘a social and economic units, low-level chiefs were able to monitor production at the individual community level within the larger context of a surplus-producing field system. The locations of heiau H4 and H6 are exceptions to this spatial pattern in that they represent infilling; and heiau H8 is an exception in that it is located on an ahupua‘a boundary. All of these structures, however, would probably have been used in productivity rituals that affected both chiefs and commoners. The functional significance of these structures would have been in the social messages that were manifest in their construction. Agricultural heiau linked local production to the larger chiefly economy and were distributed in such a way that they reinforced social relations both within the community and in relation to the larger sociopolitical system. The ideological underpinnings of these relations between different levels of society allow these structures to be viewed as an intermediate level of heiau, not just in terms of size, but also in terms of function.

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This study presents an approach to understanding the social and economic significance of heiau by relating a proposed developmental sequence for social divisions to changes in heiau morphology. The proposed historical correlation of a seriation of morphological design traits and changing socio-economic
divisions is suggestive, but should be tested through further analysis and comparison with other forms of archaeological data.

The economic and sociopolitical dimensions of religious authority can clearly be seen in the intermediate level of religious architecture examined in this study. Although the present study focuses on a limited spatial and temporal distribution of heiau features, the approach implemented here provides insight into the relationship of ritual architecture and surplus production in the late period of the Hawaiian cultural sequence (c. A.D. 1550 to A.D. 1800). By moving away from a broad scale survey approach in examining heiau form and function, which is highly variable and ambiguous in many cases, this study provides insight into local economic and sociopolitical relations between commoners and chiefs by examining a distinct functional class of religious architecture.

Although seriation may have inherent flaws, it is a useful method for analysing variation among a single class of heiau. By taking a “microregional” approach to community-level heiau, rather than integrating them into classifications of heiau that have highly variable functions, much more can be learned about the functional significance of these constructions. The inherent difficulty in classifying heiau has long been recognised and perhaps the attempt to classify all heiau forms needs to be abandoned. Only by comparing comparable things can we get closer to understanding how these structures served as material manifestations of the ideological aspects of Hawaiian society.

The construction of heiau reinforced the chiefly economy and social dimensions in pre-contact Hawaiian society. The role of heiau in Hawaiian society is complex and cannot be characterised by heiau morphology and distribution in a dryland field system alone. Nevertheless, this study shows that by using two lines of evidence an intriguing pattern emerges that can provide insights on how ideological development went hand-in-hand with economic and sociopolitical development in Hawai‘i. The wide range of heiau forms provide a difficult data set to characterise and classify as a whole, but by focusing on how a certain functionally and spatially related set of heiau may have functioned, a better understanding of the local role of these structures can be attained. Usually, a heiau is simply defined as any sacred space, but in fact heiau are much more than material manifestations of ideological aspects of Hawaiian society. These structures have much to say about the sociopolitical and economic environment to which they belonged, as well as the ideological basis for their construction and use.
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NOTES


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